

AUDITORY BRAIN WAVE STIMULATION IN TREATING ALCOHOLIC DEPRESSION

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At the time of this study Gilbert Sanders was in charge of the Chemical Dependency Unit, Mount Edgecumbe Hospital, Sitka, Alaska. As a counseling psychologist he had extensive experience with the substance abuse issues confronted by Vietnam veterans. Dr. Sanders supervised the chemical dependency unit at Leavenworth Prison, Leavenworth, Kansas, for several years and is presently (1997) assigned to the Alaskan Native Medical Center in Anchorage. Raymond Waldkoetter, the program co-developer, presented the following paper at the 1996 Monroe Institute Professional Seminar. Dr. Waldkoetter is a member of The Monroe Institute Board of Advisors and a consulting psychologist with an inclusive background in research psychology. He has a special interest in Hemi-Sync[®] applications for combating substance addiction and for improving the environment of patients in adult care homes.

Little information is currently available on Native Alaskans' recovery rates following in-hospital treatment for substance abuse (SA). It is known that many of the individuals entering such treatment indicate that they are suffering from numerous depression symptoms. This study, then, is intended to:

- establish baseline data on the prevalence of self-assessed depression in Native Alaskan/Americans (NAA) entering SA treatment;
- examine the effectiveness of cognitive/self-regulation therapy, augmented by selected auditory guidance tapes in reducing self-reported stress;
- obtain data on the success of the given therapy.

Treatment for SA has largely followed the twelve-step model initially developed by the founders of Alcoholics Anonymous in the late 1930s. Many treatment programs have been in freestanding facilities, with treatment staffs comprised almost exclusively of recovering alcoholics. Moreover, in-hospital SA treatment has at best a mixed record of success. In the late 1970s and mid 1980s, the standard stay in freestanding and hospital programs averaged about thirty days, but rising costs and other operational problems led to the decline of such facilities. At the present time, SA treatment is frequently limited to fourteen to twenty-one days. Posttreatment success rates are in the range of 20-30 percent six to twelve months after treatment. At best, only one person in three entering treatment can expect to remain substance free for one year after treatment. This rate, however, is nearly double that expected for Native Americans. Indian Health Service records of treatment success have indicated recovery rates for Native Americans are only in the range of 15-17 percent compared with the general population (Sanders 1995). The CDU program at Mount Edgecumbe Hospital includes a four-

day admission period and five weeks of chemical dependency therapy and education. The admission period allows time for psychological assessment, social history, educational assessment, medical and dental treatment, detoxification as needed, wellness orientation, and program and support group orientation.

Recently there have been some new developments in SA treatment. Peniston and Kulkosky (1989) published a study on alpha-theta brain-wave training with alcoholics which covered therapy and thirteen months of posttreatment monitoring and indicated an 80 percent recovery rate. It was the key finding of this study that brain-wave training in a biofeedback schedule produced profound increases in alpha and theta brain rhythms and decreases in self-assessed depression during the course of treatment. This biobehavioral approach to chronic alcoholism appears a promising alternative to traditional medical treatment. Also in 1989, the Federal Bureau of Prisons began to offer a cognitive behavioral program at several correctional institutions that incorporated elements of transactional analysis and rational behavioral therapy (Sanders 1989). This program differed noticeably from various twelve-step programs by focusing almost exclusively on having the individual take responsibility for his actions. Initial data showed several positive results, such as reduction in aggression and other negative behavior by inmates. But, since most hospital and residential SA treatment is still based on the twelve-step model, further research is needed to examine effective alternatives.

It is recognized that both audible and inaudible sounds and tones affect human thought and emotional conditions. Where perception may cause prolonged adverse arousal, ill health can result. Conversely, the effects of stress reduction provided by utilizing certain audio-technology can help improve mental and physiological responses. In this study, the Monroe (1982) audio-technology process was applied to augment the cognitive/self-regulation therapy of the experimental group. This process has already demonstrated positive effects in changing aspects of consciousness and of learning behavior. For example, "visualization" and "imagery"; can be enhanced when the chosen intentional instructions to the mind/body and spontaneously occurring answers from the unconscious are being supported by the auditory guidance process. The Monroe process relies on a patented audio-technology (Hemi-Sync®) to facilitate self-directed control of different states of human consciousness. The process supports bringing the brain hemispheres into a synchronized state with blended sound patterns in order to activate various stress reducing brain-wave frequencies (i.e., alpha, theta, and delta). The only appreciable difference in the Control Group (CG) and the Experimental Group (EG) schedules for this study was the augmentation of EG therapy with Hemi-Sync.

Method

The sample in this study was initially composed of twenty-eight male subjects who were treated for SA - essentially alcoholism - at the Chemical Dependency Unit (CDU) of Mount Edgecumbe Hospital, Sitka, Alaska. They were all of NAA ancestry and from a range of

socioeconomic classes (lower, middle, and upper-middle). All subjects met the following criteria:

alcohol dependence based on the Diagnostic and Statistical Manual IV (DSM-IV) published by the American Psychiatric Association;

medical records indicating at least three or more years of chronic alcoholism; and

none were on psychotropic medications for psychiatric problems during the course of the treatment program.

The CDU program at Mount Edgecumbe Hospital includes a four-day admission period and five weeks of chemical dependency therapy and education. The admission period allows time for psychological assessment, social history, educational assessment, medical and dental treatment, detoxification as needed, wellness orientation, and program and support group orientation.

The treatment period begins the Monday following admission with each weekday beginning at 5:00 A.M. All program participants are then taken to the hospital's wellness center for exercises at 5:30 A.M. in accord with physical therapy/wellness staff assignments for individual programs. At 6:30 A.M. participants return to the unit shower; breakfast is at 7:00 A.M.; and from about 7:30-7:45 A.M. each individual completes assigned chores and gets any needed medications from the staff nurse. A morning meditation period is at 7:45 A.M., and other chores and laundry requiring more attention are begun at 8:00 A.M. Individual and native art therapy begin at 8:40 A.M. with each participant having each form of therapy, a morning break, and then, normally, an education group until noon covering a variety of topics - medical aspects of SA, nutritional aspects of SA, HIV/AIDS education, etc. Following lunch and a short break the CG has "genograms" (tribal family diagrams) and/or group therapy conducted from 1:00 to 3:00 P.M. Genograms are designed to provide insight into the substance abuse dynamic and its context in hope of inspiring a sense of pride and personal responsibility for change. For the EG the auditory guidance training was conducted at 1:00 P.M. followed by "genograms" and/or group therapy at 2:00 P.M. A break was given from 3:00 to 3:30 P.M. for both groups followed by cognitive skill training. Dinner was served at 5:00 P.M. and was followed by a variety of evening activities, often including a support group meeting, and then "lights out" at 10:30 P.M. Weekend activities and education followed the same schedule, except that daily activities started at 7:00 A.M.

Subjects were not randomly assigned to the CG or EG. Random selection for treatment was considered impractical due to limited CDU and hospital staffing and because the majority of patients were being treated by Alaskan court order. The CG were under treatment from March to May 1995, and the EG were treated from July to October 1995. The CG attended the standard five-week CDU program, while the EG attended the same five-week program plus

auditory guidance training. Both groups basically adhered to the standard CDU individual and psychoeducational therapy schedule, with only the EG receiving the auditory guidance exposure. Various individual and operational problems reduced the total number of subjects from twenty-eight to twenty-four -- fifteen CG and nine EG.

Briefly, the auditory guidance sessions were conducted with subjects reporting at 1:00 P.M. to the group therapy room each weekday following a thirty-minute (grounds pass) walk. An introduction was given explaining the sounds to expect, such as ocean waves, birds, running water, or music (flute), and verbal narrative. The six tapes in the album created for this study were chosen by a panel at The Monroe Institute to enhance the NAA concept of well-being and reduce or discourage addictive behavior. A supporting brochure (Waldkoetter and Johnson 1995) was prepared to guide an "addiction change and recreation program." The audiotapes chosen for the album were Morning Exercise, H-Plus[®] De-Hab, Energy Walk, Moment of Revelation, Metamusic Winds Over the World, and Mind Food Surf. Previous studies have suggested that tape effects are cumulative and different for each individual, so that after initial exposure the tape sequence may be varied in keeping with individual choice (Waldkoetter 1983; Waldkoetter and Vandivier 1992). Two of the six tapes were preferred by the NAA subjects -- Winds over the World and Surf -- since these strongly evoked cultural and locale imagery. The subjects were given the tape introduction and asked to get into a comfortable position, with most lying on the floor using the available pillows. The group therapy room lights were dimmed. Subjects were instructed: "Let the events of today briefly leave your thoughts. For the next few moments you will hear only the sounds and voices [if there was a narrative] on the tape. Relax and listen. You will not be distracted by any sounds or noises." The given audiocassette was played completely without interruptions. At the end of the tape a wake-up countdown was given (if not on the tape), progressively waking the subjects by suggesting more energy was flowing through them from their feet to their heads, and this energy was making them feel "light and alive, full of energy and completely relaxed." After the lights were turned up subjects were asked to "slowly get up, making no quick movements, retaining the relaxed feeling and energy gained during the exercise." A short debriefing session was then conducted to determine the effectiveness of the exercise and to provide an opportunity to report any "imagery."

Subjects had received two proven psychological measures used for the standard five-week CDU program as pre- and posttreatment indicators. These were the Minnesota Multiphasic Personality Inventory 2 (MMPI2) and the Beck Depression Inventory (BDI) used to help determine the extent to which this study's purposes were met (Graham 1993; Beck 1987). A special effort was made to follow up subjects' behaviors and collect any relapse data for a one-year period following program completion as a measure of possible program success.

Results and Discussion

The MMPI2 was selected to measure depression as well as other known personality factors related to SA. The MMPI2 scores from admission for both the CG and EG were assessed to determine if any significant differences existed between the two groups prior to treatment. A series of "T tests" were calculated for the three validity scales and each of the ten primary clinical scales. Of the three validity and ten clinical scales there was only one scale -- Masculinity-Femininity (MF) -- where a significant difference existed between the CG and EG. It was concluded that with this sole exception, there was no difference between the CG and EG as measured by the MMPI2 prior to commencing treatment.

The MMPI2 Depression (D) scale produced a posttreatment significant difference with the T value of 2.06, $p=.02$ and $p<.05$, the accepted level of statistical significance, with a CG mean of 56.33 and EG mean of 46.56. The number of subjects (N) was fifteen and nine, respectively, as stated earlier. High scores indicate depressive symptoms and suicidal verbalizations. Substance abusers try to relieve such symptoms by self-medication. A significant difference also was found between posttreatment groups on the Hysteria (Hy) scale with the T value of 2.14, $p=.02$, a CG mean of 52.73 and an EG mean of 43.33. This scale indicates problems in the ability to handle stress, and high scorers are often diagnosed with panic disorder, typical for SA. As previously stated, there was a significant difference on the MF scale for CG and EG at pretreatment. A significant difference between groups at posttreatment does not yield to ready interpretation with the T value of 3.32, $p=.0001$, a CG mean of 48.93 and an EG mean of 35.55. This scale may be confounded by the CG having more sex-role concerns evolving during therapy and the severity of overall symptoms. A significant difference was also obtained between posttreatment scores on the Paranoia (Pa) scale with the T value of 2.27, $p=.02$, a CG mean of 64.53 and an EG mean of 51.55. Individuals with higher scores tend to be highly suspicious and overly sensitive, also typical for SA. A further significant difference was found between the groups on the Psychasthenia (Pt) scale with the T value of 1.78, $p=.04$, a CG mean of 59.87 and an EG mean of 50.78. Higher scores here indicate feelings of internal turmoil, lack of self-confidence, and concentration problems, other common SA traits.

On five of the ten MMPI2 clinical scales, significant differences existed between the posttreatment CG and EG as indicated above. Individuals with addictive disorders frequently show elevated scores on these scales. This small sample study indicates that cognitive/self-regulation therapy with structured auditory guidance may reduce reports of distress in these areas significantly more than cognitive/self-regulation therapy alone. It is interesting to note that the EG's scores on eight of the ten clinical scales had a posttreatment decrease, while the CG had only one. This gave a tentative significant difference using chi-squared ($\chi^2 [1, N=10] = 5.00, p < .05$).

The BDI -- as mentioned earlier -- was administered to all subjects, with a significant difference observed between these groups prior to treatment: CG mean of 16.82 and EG mean of 12.09. BDI scores in the range of 10-18 are indicative of mild to moderate depression. Since the

groups were initially different, no direct comparison is feasible. Both groups, however, had significantly lower scores at posttreatment: CG mean of 10.70 and EG mean of 5.63. It may be observed that cognitive/self-regulation therapy alone, as well as that therapy augmented by auditory guidance, reduced self-reported depressive symptoms in the NAA male sample in the SA program. Thus, while the BDI did not appear sensitive enough to facilitate direct CG and EG comparisons in this study, it did indicate favorable progress in reducing depression symptoms in these groups.

An attempt to make six-month follow-up comparisons of the CG and EG was performed. Data showed that the CG spent the mean monthly amount of \$604.17 on SA before treatment and the EG spent \$937.50. The \$333.33 difference between groups was not significant due largely to the variance within each group. There was a significant difference from pre- to posttreatment in the amounts spent on SA in both the CG and EG (but not between groups) with the CG spending \$105.83 mean/monthly and the EG \$178.33.

The CG reported the mean current number of days without SA as 73.58 while the EG reported 116.67. The positive difference of 43.09 days between groups did not prove significant -- most likely due to the sample size for each group. The longest mean period without SA increased for both groups with the CG reaching 98.58 posttreatment days and the EG 118.67. Again, although the difference is not statistically significant, the positive trend is noted. Even with the small follow-up of twelve and nine per group, the CG reports reflected a total abstinence success rate of 23 percent and the EG 35 percent when projected for one year. These percentages, though very limited, parallel favorable success rates sought in NAA therapy. An actual six-month follow-up showed the CG (N=12) had 33 percent (N=4) attaining six months sobriety. The EG (N=9) had 55 percent (N=5) with six months sobriety. Owing to the difficulties of insuring consistent posttreatment support in the home environment, EG members were allowed to retain and use the Hemi-Sync albums during the follow-up period.

This small group study of the effects of cognitive/self-regulation therapy augmented with auditory guidance on NAAs in SA treatment and six-month and projected one-year posttreatment behavior assessments indicates the following: mean scores on four MMPI2 clinical scales (depression, hysteria, paranoia, and psychasthenia) clearly relevant to SA were significantly reduced in comparison to cognitive/self-regulation therapy alone; and both therapeutic approaches significantly reduced self-reported depression as measured by the BDI. Thus, the MMPI2 and the BDI supported the study purpose of establishing baseline data on the prevalence of self-assessed depression in NAAs entering SA treatment. The value of auditory guidance training appeared confirmed somewhat in reducing self-reported stress as measured primarily by the MMPI2 and -- to a lesser degree -- the BDI. As was discussed above, only limited data were obtained on the "success" of augmenting cognitive/self-regulation therapy with auditory guidance training. There were some indications that adding auditory guidance may help reduce the monthly amount spent by NAAs failing to refrain from

SA, lengthen the period that NAAs remain abstinent, and increase the percentage of total abstinence for NAAs completing SA programming.

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